

THE REPORTED BITING AND FILTH FREQUENTING ARTHROPODS
OF THE BERMUDA ISLANDS EXCLUSIVE OF THE IXODOIDAE
AND ARANEIDA¹

ROGER W. WILLIAMS, *School of Public Health and Administrative Medicine,
Columbia University, New York, N. Y.*

At the annual meeting of the Entomological Society of America in December of 1956, Dr. B. V. Travis (1957) commented, "Experience during the past two decades has brought rather forcefully to our attention the need for a better understanding of the world wide distribution of arthropods of medical importance. Numerous unfortunate experiences in the past could have been either avoided or minimized had everyone been more aware of the local pest and disease problems in various areas of the world. These well documented catastrophes are ample proof of the need for more adequate data."

Although the Bermuda Islands, 600 miles off the coast of North Carolina, served as a strategically located U. S. air and naval base during World War II and will undoubtedly continue to serve as the location for such bases for years to come, no extensive effort had been made to ascertain the local pest and potential disease vectors among the arthropods until the author conducted such studies in 1955 and 1957. Johnson (1913) published on the dipteran fauna of the Bermudas, Ogilvie (1928) published a list of insects of these islands, and Waterston (1940) put out a supplementary list of Bermuda insects. These lists were probably somewhat incomplete and there may have been a considerable introduction of arthropods into the Bermudas in recent years. Air traffic into these islands continues to increase every year and planes come in daily from many distant parts of the globe. Interior spraying of civilian planes does not take place until all passengers have disembarked and very possibly any arthropods also. Here insects have been seen to fly from luggage when opened for the first time. As in most port areas there has been some rat exodus from ships for among the rodent ectoparasites was found a mite, *Marquesania expansa* (Ferris), known previously only from the Marquesas Islands.

Since the results of the 1955 and 1957 studies, which have been reported in a series of 7 papers (see References), are somewhat scattered and since it is most difficult to obtain Ogilvie's paper the intent of this paper is to bring together under one title a list of the reported biting and filth frequenting arthropods, exclusive of the Ixodoidea and Araneida, of the Bermuda Islands as found by the earlier investigators and by the present author in an attempt to fill the need for more adequate and accessible data of this nature. The

¹Contribution No. 253 of the Bermuda Biological Station. The 1955 investigations of the author was the result of a National Science Foundation grant-in-aid and a Childs Frick Fellowship from the Bermuda Biological Station. The 1957 investigations were sponsored by the Public Health Service, National Institutes of Health, research grant E-1350 and from the Childs Frick Fund of the Bermuda Biological Station.

Ixodoidae have been omitted because nothing is known about them other than the fact that some species of Ixodoidae have been noted on cattle and dogs by the local veterinarians. Since the Araneidae lie outside of the field of study of the author this group has likewise been omitted. The biting louse, *Linognathus setosus* (von Olfers), from a dog, is herewith reported from these islands for the first time in this paper. Biological information on many of the species may be obtained by consulting the original papers. The listing given here is alphabetically arranged and those species which have been shown to be a part of the Bermuda fauna by the author are preceded by an asterisk. Those species which are followed by † have been confirmed by the local Health Department and local doctors, through Dr. W. H. Sutcliffe, Jr., Director of the Bermuda Biological Station, as occurring in the Bermudas. It is doubtful if they have previously been reported from these islands. The information on the Myriapoda was supplied by Mr. I. W. Hughes, Assistant Director of the Bermuda Botanical Gardens of the Bermuda Department of Agriculture.

CLASS ARACHNIDA

Order ACARINA²

Family LAELAPTIDAE

Androlaelaps* sp.Echinolaelaps echidninus* (Berlese)**Laelaps nuttalli* Hirst

Family LISTOPHORIDAE

**Marquesania expansa* (Ferris)

Family SARCOPTIDAE

Sarcoptes scabiei (DeGeer) †

CLASS INSECTA

Order ANOPLURA

Family HOPOPLEURIDAE

**Polyplax spinulosa* (Burmeister)

Family LINOGNATHIDAE

**Linognathus setosus* (von Olfers)

Family PEDICULIDAE

Pediculus humanus humanus (capitis) L. †*Pediculus humanus corporis* (DeGeer) †*Phthirus pubis* (L.) † (Thought not to be indigenous but occasionally brought in by visitors.)² Mite ectoparasites of rodents and man only.

Order DIPTERA³Family **CALLIPHORIDAE**

Calliphora vomitoria (L.) (None captured in 1957.)

**Callitroga macellaria* (Fab.) (Most common filth fly on the islands in 1957.)

Lucilia caesar (L.) (It is not known whether this species as reported by Ogilvie as found by Verrill in 1902 and by himself in 1923-28 is the true *caesar*, which apparently does not occur elsewhere in North America, or *L. illustris*, which is the *L. caesar* of many North America workers, or *Phaenicia caeruleiviridis* or *P. mexicana* which have been identified as *L. caesar* by some workers. None were trapped in 1957.)

Phaenicia problematica (Johnson) (None captured in 1957.)

Phaenicia sericata (Meig.)

Stomorphina (Idia) lunata (Fab.) (None captured in 1957.)

Family **CULICIDAE**

Aedes aegypti (L.)

Aedes sollicitans (Walk.)

Aedes taeniorhynchus (Wied.)

Culex pipiens quinquefasciatus Say

**Culex salinarius* Coq.

Family **HELEIDAE**

**Bezzia atlantica* Wirth and Williams

**Culicoides bermudensis* Williams

**Culicoides crepuscularis* Malloch

**Culicoides floridensis* Beck

**Dasyhelea atlantis* Wirth and Williams

**Dasyhelea bermudae* Wirth and Williams

**Dasyhelea cincta* (Coq.)

**Dasyhelea grisca* (Coq.)

**Dasyhelea luteogrisca* Wirth and Williams

**Dasyhelea scissurae* Macfie

**Forcipomyia ingrami* Carter

**Forcipomyia raleighi* Macfie

**Forcipomyia varipennis* Wirth and Williams

Pterobosca fusicornis (Coq.) = (*Ceratopogon fur* Johnson. None captured in 1955 or 1957.)

Family **MUSCIDAE**

**Atherigona orientalis* Schin.

Fannia pusio (Wied.)

Musca domestica L.

Ophyra aenescens (Wied.)

Stomoxys calcitrans (L.)

Synthesiomyia nudiseta (Wulp.) = *S. brasiliiana* B. & B.

Family **ORTALIDAE**

Euxesta sp.

³ Only biting forms and species attracted to decomposing organic matter are reported here. See Ogilvie and Johnson for other families, genera and species.

Family **CHLOROPIDAE***Hippelates ptebejus* Loew*Hippelates pusio* LoewFamily **SARCOPHAGIDAE***Sarcophaga assidua* Walk. (Probably *ventricosa*.)*Sarcophaga georgina* Wied. (Not collected in 1957.)*Sarcophaga helieis* (Townsend) (Probably either *morionella* or *rapax*.)**Sarcophaga lherminieri* (R.-D.)**Sarcophaga morionella* Ald.**Sarcophaga rapax* Walk.**Sarcophaga ventricosa* Wulp.*Sarcophagula* sp. (Not collected in 1957.)Family **TABANIDAE***Stenotabanus atlanticus* (Johnson)*Tabanus nigrovittatus* Macq.*Tabanus* sp. close to *costalis* (According to Ogilvie, reported only by H. H. Whetzel in "Annual Reports of the Board and Department of Agriculture, Bermuda," and Bld. Dept. Agr., Agr. Bulln. for 1921, 1922, 1923. This species has apparently not been seen in recent years.)

Order HEMIPTERA

Family **CIMICIDAE***Cimex lectularius* L.

Order ORTHOPTERA

Family **BLATTIDAE***Blatella germanica* (L.)*Blatta orientalis* L.*Ceratinoptera diaphana* Fab.*Leucophaea maderae* (Fab.)*Periplaneta americana* L.*Periplaneta australasiae* (Fab.)*Pyrenoscelus surinamensis* (L.)

Order SIPHONAPTERA

Family **PULICIDAE***Ctenocephalides canis* (Curtis) (Not found in 1957.)**Ctenocephalides felis* (Bouche) (May have been *canis* reported by Ogilvie.)*Pulex irritans* (L.)**Xenopsylla cheopis* (Roth.)Family **SARCOPSYLLIDAE***Echidnophaga gallinacea* (Westw.)*Tunga penetrans* (L.) (Ogilvie thought that this species may no longer be present on the Islands. None were found in 1957.)

CLASS MYRIAPODA

Order CHILOPODA

Family **LITHOBIIDAE***Lithobius lapidicola* Mein.

Family **MECISTOCEPHALIDAE***Mecistocephalus guilingii* NewportFamily **SCOLOPENDRIDAE***Scolopendra subspinipes* LeachFamily **SCUTIGERIDAE***Scutigera forceps* Raf.Order **DIPLOPODA**Family **JULIDAE***Julus morcleti* Lucas*Julus* spp.Family **SPIROBOLIDAE***Spirobolus heilprini* Bollman.

REFERENCES

- Johnson, C. W., 1913. The Dipteran fauna of Bermuda. *Ann. Ent. Soc. Amer.* 6: 443-452.
- Ogilvie, L. 1928. The insects of Bermuda. Dept. of Agr., Bermuda.
- Travis, B. V., 1957. Worldwide compilations of arthropods of medical importance. *J. Econ. Ent.* 50(5): 705-706.
- Waterston, J. M., 1940. Supplementary list of Bermuda insects. Dept. of Agr., Bermuda.
- Williams, R. W., 1956. A new distribution record for *Culex salinarius* Coq.—the Bermuda Islands. *Mosquito News* 16(1): 29-30.
- , 1956. The biting midges of the genus *Culicoides* found in the Bermuda Islands (Diptera, Heleidae). I. A description of *C. bermudensis* n. sp. with a key to the local fauna. *J. Parasit.* 42(3): 297-300.
- , 1956. The biting midges of the genus *Culicoides* found in the Bermuda Islands (Diptera, Heleidae). II. A study of their breeding habitats and geographical distribution. *J. Parasit.* 42(3): 300-305.
- , 1957. Observations on the breeding habitats of some Heleidae of the Bermuda Islands (Diptera). *Proc. Ent. Soc. Wash.* 59(2): 61-66.
- , 1958. A study of the summer filth fly population of the Bermuda Islands. *J. Parasit.* 44(3): 339-342.
- , 1959. Ectoparasites of *Rattus rattus* (L.) in the Bermuda Islands, with a note on *Ctenocephalides felis* (Bouché) (Siphonaptera, Pulicidae). *Proc. Ent. Soc. Wash.* 61(1): 33-35.
- Wirth, W. W. and Williams, R. W., 1957. The biting midges of the Bermuda Islands, with descriptions of five new species. (Diptera, Heleidae). *Proc. Ent. Soc. Wash.* 59(1): 5-14.

PUBLICATION DATES

The date of publication of Vol. 61, No. 4, of the *Proceedings* was 11 September 1959. The date of publication of Vol. 61, No. 5, will be found in Vol. 61, No. 6.